

## § 111.105-15

partitioned by a grounded metal barrier from other non-intrinsically safe electric cables, or a shielded or metallic armored cable; and

(2) Not contain conductors for non-intrinsically safe systems.

(c) As part of plan approval, the manufacturer must provide appropriate installation instructions and restrictions on approved system components. Typical instructions and restrictions include information addressing—

(1) Voltage limitations;

(2) Allowable cable parameters;

(3) Maximum length of cable permitted;

(4) Ability of system to accept passive devices;

(5) Acceptability of interconnections with conductors or other equipment for other intrinsically safe circuits; and

(6) Information regarding any instructions or restrictions which were a condition of approval of the system or its components.

(d) Each intrinsically safe system must meet ISA RP 12.6 (incorporated by reference, see 46 CFR 110.10-1), except Appendix A.1.

[CGD 94-108, 61 FR 28284, June 4, 1996, as amended at 62 FR 23909, May 1, 1997; USCG-2003-16630, 73 FR 65200, Oct. 31, 2008]

## § 111.105-15 Additional methods of protection.

Each item of electrical equipment that is—

(a) A powder-filled apparatus must meet IEC 60079-5 (incorporated by reference; see 46 CFR 110.10-1);

(b) An oil-immersed apparatus must meet either IEC 79-6 (incorporated by reference; see 46 CFR 110.10-1) or Article 500.7(I) of NFPA NEC 2002 (incorporated by reference; see 46 CFR 110.10-1);

(c) Type of protection “e” must meet IEC 60079-7 (incorporated by reference; see 46 CFR 110.10-1);

(d) Type of protection “n” must meet IEC 60079-15 (incorporated by reference; see 46 CFR 110.10-1); and

(e) Type of protection “m” must meet IEC 60079-18 (incorporated by reference; see 46 CFR 110.10-1).

[USCG-2003-16630, 73 FR 65200, Oct. 31, 2008, as amended by USCG-2013-0671, 78 FR 60153, Sept. 30, 2013]

## 46 CFR Ch. I (10-1-13 Edition)

## § 111.105-17 Wiring methods for hazardous locations.

(a) Through runs of marine shipboard cable meeting subpart 111.60 of this part are required for all hazardous locations. Armored cable may be used to enhance ground detection capabilities. Additionally, Type MC cable may be used subject to the restrictions in § 111.60-23.

(b) Where conduit is installed, the applicable requirements of either NFPA NEC 2002 (incorporated by reference; see 46 CFR 110.10-1) or the IEC 60079 series (as defined in § 111.105-1 and incorporated by reference; see 46 CFR 110.10-1) must be followed.

(c) Each cable entrance into explosionproof or flameproof equipment must be made with approved seal fittings, termination fittings, or glands that meet the requirements of § 111.105-9.

(d) Each cable entrance into Class II and Class III (Zone 10, 11, Z, or Y) equipment must be made with dust-tight cable entrance seals approved for the installation.

[CGD 94-108, 61 FR 28284, June 4, 1996, as amended at 62 FR 23909, May 1, 1997; USCG-2003-16630, 73 FR 65200, Oct. 31, 2008]

## § 111.105-19 Switches.

A switch that is explosionproof or flameproof, or that controls any explosionproof or flameproof equipment, under § 111.105-19 must have a pole for each ungrounded conductor.

[CGD 94-108, 61 FR 28284, June 4, 1996]

## § 111.105-21 Ventilation.

A ventilation duct which ventilates a hazardous location has the classification of that location. Each fan for ventilation of a hazardous location must be nonsparking.

[CGD 94-108, 61 FR 28285, June 4, 1996]

## § 111.105-27 Belt drives.

Each belt drive in a hazardous location must have:

(a) A conductive belt; and

(b) Pulleys, shafts, and driving equipment grounded to meet NFPA 77 (incorporated by reference, see 46 CFR 110.10-1).

[CGD 74-125A, 47 FR 15236, Apr. 8, 1982, as amended by USCG-2003-16630, 73 FR 65200, Oct. 31, 2008]

**§ 111.105-29 Combustible liquid cargo carriers.**

(a) Each vessel that carries combustible liquid cargo with a closed-cup flashpoint of 60 degrees C (140 degrees F) or higher must have:

(1) Only intrinsically safe electric systems in cargo tanks; and

(2) No storage battery in any cargo handling room.

(b) If a submerged cargo pump motor is in a cargo tank, it must meet the requirements of § 111.105-31(d).

(c) Where the cargo is heated to within 15 °C of its flashpoint, the cargo pumproom must meet the requirements of § 111.105-31(f) and the weather locations must meet § 111.105-31(l).

[CGD 74-125A, 47 FR 15236, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28285, June 4, 1996; 61 FR 36787, July 12, 1996; 61 FR 39695, July 30, 1996]

**§ 111.105-31 Flammable or combustible cargo with a flashpoint below 60 °C (140 °F), carriers of liquid-sulphur or inorganic acid.**

(a) *Applicability.* Each vessel that carries combustible or flammable cargo with a closed-cup flashpoint lower than 60 degrees C (140 degrees F) or liquid sulphur cargo, or inorganic acid cargo must meet the requirements of this section, except—

(1) A vessel carrying bulk liquefied flammable gases as a cargo, cargo residue, or vapor which must meet the requirements of § 111.105-32; and

(2) A vessel carrying carbon disulfide must have only intrinsically safe electric equipment in the locations listed in paragraphs (e) through (l) of this section.

(b) *Cable location.* Electric cable must be as close as practicable to the centerline and must be away from cargo tank openings.

(c) *Lighting circuits.* An enclosed hazardous space that has explosionproof lighting fixtures must:

(1) Have at least two lighting branch circuits;

(2) Be arranged so that there is light for relamping any deenergized lighting circuit; and

(3) Not have the switch within the space for those spaces containing explosionproof lighting fixtures under paragraphs (g), (i) and (j) of this section.

(d) *Submerged cargo pump motors.* If a submerged cargo pump motor is in a cargo tank:

(1) Low liquid level, motor current, or pump discharge pressure must automatically shutdown power to the motor if the pump loses suction;

(2) An audible and visual alarm must be actuated by the shutdown of the motor; and

(3) There must be a lockable circuit breaker or lockable switch that disconnects power to the motor.

(e) *Cargo Tanks.* A cargo tank is a Class I, Division 1 (IEC Zone 0) location that has additional electrical equipment restrictions outlined in section 33 of IEEE 45-1998 and IEC 60092-502 (both incorporated by reference; see 46 CFR 110.10-1). Cargo tanks must not contain any electrical equipment except the following:

(1) Intrinsically safe equipment; and

(2) Submerged cargo pump motors and their associated cable.

(f) *Cargo handling rooms.* A cargo handling room must not have any electric cable or other electric equipment, except:

(1) Intrinsically safe equipment;

(2) Explosionproof lighting fixtures;

(3) Cables supplying intrinsically safe equipment in the cargo handling room; and

(4) Marine shipboard cables that supply explosionproof lighting fixtures that are in the cargo handling room.

(g) *Lighting of cargo handling rooms.* Lighting for a cargo handling room except a cargo handling room under paragraph (h) of this section, must be lighted through fixed glass lenses in the bulkhead or overhead. Each fixed glass lens must be wire-inserted glass that is at least 0.25 inches (6.35 mm) thick and arranged to maintain the watertight and gastight integrity of the structure. The fixed glass lens may form a part of